Java EE 6: Develop Web Services with JAX-WS & JAX-RS

Course code: D77754

This Java EE 6 programming course covers the design and creation of SOAP and RESTful web services and clients. You'll use the NetBeans Integrated Development Environment (IDE) to develop JAX-WS and JAX-RS web services and deploy those services to Oracle WebLogic Server 12c. The majority of topics covered are portable across all application servers which support the Java EE 6 web service standards.Java EE 6 technology facilitates cross-platform application development through the use of platform neutral network communication, supports HTML5 AJAX enabled applications and mobile clients by creating RESTful web services which use the JSON data-interchange format. Enrolling in this course will help you stay current on the latest Java EE 6 web service APIs.

Affiliate	Duration	Course price	ITB
Praha	5	60 980 Kč	75
Brno	5	60 980 Kč	75
Bratislava	5	2 250 €	75

The prices are without VAT.

Course terms

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What we teach you

- Create XML documents and XML schemas while using XML Namespaces.
- Produce and consume JSON and XML using JAXB.
- Understand WSDL files and the role they play in SOAP based web services and select either a top-down (WSDL first) or bottom-up (code first) approach to the development of SOAP web services.
- Make calls to and implement web services based on SOAP standards using JAX-WS (Metro Stack).
- Implement REST practices in the creation of web services with the JAX-RS specification (Jersey Stack).
- Secure web services using Java EE Security standards, WS-Security extensions, and OAuth 1.0a.

Required skills

- Java SE7 Fundamentals
- Java SE 7 Programming
- Tutorials available on the Oracle Learning Library
- Oracle Certified Associate, Java SE 7 Programmer
- Oracle Certified Professional, Java SE 7 Programmer
- Java SE 7: Develop Rich Client Applications
- Java Design Patterns

Teaching methods

Expert instruction with practical examples, computer practice

Oracle Training Formats

Training on Demand, one of the most popular learning formats, allows students to learn whenever they need (24/7, 90 days). These video recorded courses are led by TOP instructors. Other learning formats are traditional in-class training, Live Virtual Class, or Self-Study Courses. Read more here.

Teaching materials

The student materials include comprehensive courseware and other necessary materials for this class. All reading materials are in English.

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Course outline

An Introduction to Web Services
- Explaining the need for web services
- Defining web services
- Explaining the characteristics of a web service
- Explaining the use of both XML and JSON in web services
- Identifying the two major approaches to developing web services
- Explaining the advantages of developing web services within a Java EE container

XML
- Describing the Benefits of XML
- Creating an XML Declaration
- Assembling the Components of an XML Document
- Declaring and Apply XML Namespaces
- Validating XML Documents using XML Schemas
- Creating XML Schemas

JAXB
- Listing the Different Java XML APIs
- Explaining the Benefits of JAXB
- Unmarshalling XML Data with JAXB
- Marshalling XML Data with JAXB
- Compiling XML Schema to Java
- Generating XML Schema from Java Classes
- Applying JAXB Binding Annotations
- Creating External Binding Configuration Files

SOAP Web Services
- SOAP message structure
- Using WSDL files to define web services
- WS-I Basic Profile and WS-Policy

Creating JAX-WS Clients
- Using tools to generate JAX-WS client artifacts
- Calling SOAP web services using JAX-WS in a Java SE environment
- Calling SOAP web services using JAX-WS in a Java EE environment
- Using JAXB Binding customization with a SOAP web service
- Creating a JAX-WS Dispatch client
- Creating a client that consumes a WS-Policy enhanced services (WS-MakeConnection)

RESTful Web Services
- Describing the RESTful architecture and how it can be applied to web services
- Designing a RESTful web service and identify resources
- Navigating a RESTful web service using hypermedia
- Selecting the correct HTTPethod to use when duplicate requests must be avoided
- Identifying Web Service result status by HTTP response code
- Version RESTful web services

Creating RESTful Clients in Java
- Using Java SE APIs to make HTTP requests
- Using the Jersey Client APIs to make HTTP requests
- Processing XML and JSON in a RESTful web service client

Bottom-Up JAX-WS Web Services

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- Describing the benefits of Code First Design
- Creating JAX-WS POJO Endpoints
- Creating JAX-WS EJB Endpoints

Top-Down JAX-WS Web Services

- Describing the benefits of WSDL First Design
- Generating Service Endpoint Interfaces (SEIs) from WSDLs
- Implementing Service Endpoint Interfaces
- Customizing SEI Generation

JAX-RS RESTful Web Services

- Download, Install, and Configure Jersey
- Creating Application Subclasses
- Creating Resource Classes
- Creating Resource Methods, Sub-Resource Methods, and Sub-Resource Locator Methods
- Producing and Consume XML and JSON content with JAX-RS

Web Service Error Handling

- Describing how SOAP web services convey errors
- Describing how REST web services convey errors
- Returning SOAP faults
- Returning HTTP error status codes
- Mapping thrown Exceptions to HTTP status codes
- Handling errors with SOAP clients
- Handling errors with Jersey clients

Security Concepts

- Explaining Authentication, Authorization, and Confidentiality
- Applying Basic Java EE Security by using deployment descriptors (web.xml)
- Creating users and groups and map them to application roles
- Detailing possible web service attack vectors

WS-Security

- Describing the purpose of WS-Policy, WS-SecurityPolicy, WS-Security
- Configuring WebLogic Server for WS-Security
- Applying WS-Policy to WebLogic JAX-WS Web Services
- Signing and Encrypt SOAP Messages using WS-Security

Web Service Security with Jersey

- Applying JSR-250 Security Annotations such as @RolesAllowed
- Enabling an assortment of filters including the RolesAllowedResourceFilterFactory
- Obtaining a SecurityContext and perform programmatic security
- Authenticating using the Jersey Client API

OAuth 1.1a with Jersey

- Describing the purpose of OAuth
- Describing the request lifecycle when using OAuth
- Creating OAuth enabled services using Jersey
- Creating OAuth enabled clients using Jersey

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